

Appl. No. 10/695,078
Amendment dated May 29, 2008

Attorney Docket No.: 60.1543 US NP

REMARKS

Claims 1-47 are currently pending in the application. By this amendment, independent claims 1, 8, 18, 23, 31, 34, 37, 41, 41, 43, 45 will have been amended for the Examiner's consideration. Further, Applicant submits claims 48-57 will have been added for the Examiner's consideration.

Accordingly, reconsideration and withdrawal of the pending rejections are requested in view of the instant amendment and the accompanying remarks.

Amendment to the Claims are Fully Supported by the Original Disclosure

The above amendments do not add new matter to the application and are fully supported by the specification.

Applicant notes independent claims 1, 8, 18, 23, 31, 34, 37, 41, 41, 43, 45 will have been amend to specify a "said first motorized reaction mass using a plurality of variable angle pushing rods to convert an axial motion into a radial motion so that said at least two pads generate elastic waves through the earth formation upon activation of said first motorized reaction mass as a result of impact of the pads against the wall". Further, support for amending independent claims 1, 8, 18, 23, 31, 34, 37, 41, 41, 43, 45 are provided at paragraphs [0016], [0032], [0037] and [0046] of the specification.

Applicant notes new dependent claims 48-57 will have been added to specify a "wherein the impedance of the acoustic borehole source may be controlled using said plurality of variable angle pushing rods *such that a first individual variable angle pushing rod and a second individual variable angle pushing rod of said plurality of variable angle pushing rods have an ability to have different angles relative to said axis of said sonde*".

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Further still, new claims 48-57 do not add new matter to the application and are fully supported by the specification also the subject matter of the dependent claims does not necessitate a new search because it had already been searched based on the claim language of the previously presented independent claims. For example, support for adding claims 48-57 are provided at paragraphs [0032] to [0035] and [0037] to [0046] of the specification.

Applicant respectfully requests reconsideration and timely withdrawal of the pending rejections for the reasons discussed below.

35 U.S.C. § 103 Rejections

Over CHELMINSKI in view of MALLET

Claims 1-9, 12-24, 27-36 and 41-44 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chelminski (US 4,712,641) (hereafter "CHELMINSKI") in view of Mallet et al. (US 4,700,803) (hereafter "MALLET"). The Examiner asserts that CHELMINSKI shows all of the features except for a borehole source, that the waves are created via a wall, or that the reaction masses are motorized. However, the Examiner asserts that such features are shown in MALLET, and that it would have been obvious to modify CHELMINSKI to include the features of MALLET. Applicant traverses the Examiner's assertions, in view of Applicant's currently amended independent claims.

Applicant's independent claims 1, 8, 18, 23, 31, 34, 41, 41, 43 recites, among other limitations, in essence, "said first motorized reaction mass using a plurality of variable angle pushing rods to convert an axial motion into a radial motion so that said at least two pads generate elastic waves through the earth formation upon activation of

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said first motorized reaction mass as a result of impact of the pads against the wall." Applicant respectfully notes that although each independent claim may not recite the above note exact claim language, all of the independent claims include the phrase "said first motorized reaction mass using a plurality of variable angle pushing rods to convert an axial motion into a radial motion".

Applicant respectfully submits that a *prima facie* case of obviousness has not been established as the applied references fail to teach each and every element of the independent claims.

Applicant submit that neither CHELMINSKI nor MALLETT disclose or suggest the combination of features recited in at least independent claims, as currently amended. Applicant also submits that no proper combination of these documents disclose or suggest the combination of features recited in the independent claims, as currently amended.

CHELMINSKI shows a transport carrier (T) (see Figures 1 & 12 and Col. 4, line 68 of CHELMINSKI) that travels along the surface of the earth, having a hanger assembly 10 holding a vertically extending hydraulic lift 12 rotatable about a pivot axis 14 or parallel to the surface that further holds a seismic energy generator 21 (see Figure 1 and Col. 5, lines 3-13 of CHELMINSKI). The seismic energy generator 21 has a cylinder 20 with a plurality of triangularly shaped gussets 22 (see Figure 2) extending downwardly from the lower end of the cylinder 20 and support the housing 24 of a horizontal pivot shaft bearing assembly 26, which are pivotally suspended from the opposite ends of bearing assembly 26 (see Figure 1 and Col. 5, lines 15-25 of CHELMINSKI), respectively, this document fails to teach or suggest the combination of

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features recited in at least independent claims, as currently amended, *said first motorized reaction mass using a plurality of variable angle pushing rods to convert an axial motion into a radial motion so that said at least two pads generate elastic waves through the earth formation upon activation of said first motorized reaction mass as a result of impact of the pads against the wall*, among other things. Applicant submits that no proper combination of the applied art can render unpatentable the instant invention.

MALLET shows an acoustic logging tool or sonde 10 suspended on a cable 12 in a well borehole 14, wherein the sonde 10 has acoustic electronics 30 and acoustic transducers 32 (see Figures 1, Col. 2, lines 29-51 of MALLET). The acoustic transducers 32 includes a structure 34 with elements 36 with coils 38 and 39 that are used to generate a signal magnetic field with the element 36 biasing a transducer plate in and out (see Figure 4, Col. 3, lines 24-52 of MALLET), as opposed to CHELMINSKI, which discloses a hydraulic lift 12 (Figure 1) to lower the seismic wave generator 21 to bear against the surface of the earth. As the devices in the cited documents operate in different manners, Applicant submits that it would not have been obvious to change the reaction masses of CHELMINSKI to include motors from the MALLET device, nor is there any suggestion in the art of record that such a modification, even if obvious (which Applicant submit it is not) would allow CHELMINSKI to operate in its intended manner. In particular, Applicant submits that if CHELMINSKI were combined with MALLET, (which Applicant submit it cannot) it is unclear how either of these devices could be combined together without a complete reengineering, and even if possible, the intended reengineered device would not operate either as it intended manner or even at all. Respectfully, contrary to the Examiner assertions that the reaction masses are

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motorized in the MALLET device, Applicant notes upon a closer review of the MALLET reference, coils 38 and 39 are used to generate a signal magnetic field with the element 36 biasing a transducer plate in and out (see Figure 4, Col. 3, lines 24-52 of MALLET), as noted above. Applicant submits that no proper combination of the applied art can render unpatentable the instant invention.

The Examiner acknowledges that CHELMINSKI lacks, among other things, the borehole source and that the waves are created via a wall. However, the Examiner explains that these features are taught by MALLET and that it would have been obvious to combine the teachings of these documents. Applicant respectfully submits that a *prima facie* case of obviousness has not been established as the applied references fail to teach or suggest making such a modification.

Applicant notes that it is not apparent from the Examiner's rejection how or why one ordinarily skilled in the art would modify CHELMINSKI to include the features of MALLET, e.g., to include a borehole source and that the waves are created via a wall. In particular, CHELMINSKI discloses a surface seismic energy generator 21 mounted on a truck T that uses an air gun 80 (Figures 2- 4, 7-8) which sends an explosive shock into surrounding water 160 (Figure 8) toward the reaction mass 118 which produces a downward shock 162 (Figure 8) generating compressional (P) waves 164 into the earth (see Figures 2-4 and 7-8, Col. 8, line 41 to Col. 9, line 51), nothing in CHELMINSKI teaches or suggests providing using borehole source and that the waves are created via a wall. In fact, the CHELMINSKI device operates in a completely different manner than the MALLET device and it is unclear how these devices could be combined, as asserted by the Examiner, to end up with a device that operates in the intended manner of

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CHELMINSKI.

MALLET discloses the sonde 10 suspended from the cable 12 in the borehole 14, wherein acoustic transducers have coils 38 & 39 used to generate a signal magnetic field with the element 36 biasing a transducer plate in and out (see Figure 4, Col. 3, lines 24-52 of MALLET), thus, in part, the movement creates the compression wave, as opposed to CHELMINSKI, which discloses using an air gun 80 which sends an explosive shock into surrounding water 160 toward the reaction mass 118 which produces a downward shock 162 generating compressional (P) waves 164 into the earth (see Figures 2-4 and 7-8, Col. 8, line 41 to Col. 9, line 51), as noted above.

Moreover, Applicant notes that the applied documents of record fail to teach the requisite motivation or rationale for combining CHELMINSKI and MALLET as suggested by the Examiner.

Respectfully, Applicant notes, in particular, the CHELMINSKI and MALLET references also fails to disclose, or even suggest:

- 1) As described in this application in paragraph [0030], "acoustic energy is generated into the formation 10 when two or more pads 30 **contact** the formation wall 20." (emphasis added) Consequently, "the pads may be of any material able to withstand the ... **impact** against the formation wall as induced by the motors." (emphasis added) In other words, the pads are not merely conduits of acoustic energy that operate by being secured and locked against the wall in a rigid manner, but rather generate the acoustic energy by striking the wall.
- 2) Because each of the pushing rods is connected to a reaction mass, none of the pushing rods pivot around a fixed position relative to the tool body. An

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advantage of the claimed configuration is that the pushing angle can be changed to enhance propagation, as described in the Specification at paragraphs [0035-0036]. In particular, the angle at which the force is imparted against the casing can be selected by controlling the motorized reaction masses to change the pushing rod angle with respect to the casing, whereas the cited combination would have a fixed angle. Further, the claimed invention can achieve additional enhancements by changing the phase differential between the motorized reaction masses, as described in the Specification at paragraphs [0035-0036]. These features enable production of different wave types which would not be possible with the cited combination, even assuming the clamping features were somehow suitable for generating acoustic disturbances.

A § 103 rejection requires the Examiner to first establish a prima facie case of obviousness: "The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the Examiner does not produce a prima facie case, the Applicant is under no obligation to submit evidence of nonobviousness." MPEP 2142. The Court of Appeals for the Federal Circuit has set forth three elements, which must be shown for prima facie obviousness:

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teachings or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the

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prior art, and not based on Applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Further, as noted above, the CHELMINSKI and MALLETT devices are distinct from each other. Thus, because the art of record fails to provide the necessary motivation or rationale for combining the art of record in the manner asserted by the Examiner, Applicant submits no proper combination of CHELMINSKI and MALLETT teach or suggest the combination of features recited in at least the independent claims.

Further, Applicant submits that claims 2-7, 12-17, 19-22, 24, 27-30, 32-36, 42, and 44 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. Moreover, Applicant submits that, as the above-noted claims recite additional features of the invention not disclosed by any proper combination of CHELMINSKI in view of MALLETT, these further claims are separately patentable over the art of record.

Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejection of claims 1-9, 12-24, 27-36 and 41-44 under 35 U.S.C. §103(a) and indicate that these claims are allowable.

Over CHELMINSKI in view of MALLETT in further view of PAULSSON

Claims 10 and 25 were rejected under 35 U.S.C. § 103(a) for being allegedly unpatentable over CHELMINSKI in view of MALLETT in further view of Paulsson (U.S. 4,715,470) (hereafter "PAULSSON").

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The Examiner acknowledges that CHELMINSKI as modified by MALLET lacks, among other things, a compression spring connecting the first and second motorized reaction masses. However, the Examiner explains that this feature is taught by PAULSSON and that it would have been obvious to combine the teachings of these documents. Applicant respectfully submits that a *prima facie* case of obviousness has not been established as the applied references fail to teach each and every element of the claims, as fully discussed above.

Applicant submits that neither CHELMINSKI, MALLET nor PAULSSON disclose or suggest the combination of features recited in at least independent claims, as currently amended. Applicant also submits that no proper combination of these documents disclose or suggest the combination of features recited in at least independent claims, as currently amended.

As explained above, PAULSSON lacks any disclosure or suggestion with regard the noted above deficiencies of either CHELMINSKI or MALLET references.

Moreover, in addition to failing to disclose the combination of features recited in the above-noted independent claims, as currently amended, Applicant submits no proper combination of these documents discloses or suggests the combination of features recited in independent claims or in the above-noted claims which depends from the independent claims.

Accordingly, Applicant respectfully submits that the above-noted rejection under 35 U.S.C. § 103(a) should be withdrawn.

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Over CHELMINSKI in view of MALLETT in further view of BRETT

Claims 11, 26 and 37-40 were rejected under 35 U.S.C. § 103(a) for being allegedly unpatentable over CHELMINSKI in view of MALLETT in further view of Brett et al. (U.S. 4,715,470) (hereafter "BRETT").

The Examiner acknowledges that CHELMINSKI as modified by MALLETT lacks, among other things, a third and fourth masses and the common connection between reaction masses and the pads. However, the Examiner explains that this feature is taught by BRETT and that it would have been obvious to combine the teachings of these documents. Applicant respectfully submits that a *prima facie* case of obviousness has not been established as the applied references fail to teach each and every element of the claims, as fully discussed above.

Applicant submits that neither CHELMINSKI, MALLETT nor BRETT disclose or suggest the combination of features recited in at least independent claims, as currently amended. Applicant also submits that no proper combination of these documents disclose or suggest the combination of features recited in at least independent claims, as currently amended.

As explained above, BRETT lacks any disclosure or suggestion with regard the noted above deficiencies of either CHELMINSKI or MALLETT references.

Moreover, in addition to failing to disclose the combination of features recited in the above-noted independent claims, as currently amended, Applicant submits no proper combination of these documents discloses or suggests the combination of features recited in independent claims or in the above-noted claims which depends from the independent claims.

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Accordingly, Applicant respectfully submits that the above-noted rejection under 35 U.S.C. § 103(a) should be withdrawn.

New Claims are also Allowable

Applicant submits that the new claims 48-57 are allowable over the applied art of record. Specifically, claims 48-57 depend from independent claims which are believed to be allowable. Additionally, claims 48-57 recite a combination of features which are clearly not disclosed or suggested by the applied art of record. Specifically, Applicant submits that the applied documents fail to disclose or suggest, for example, the impedance of the acoustic borehole source may be controlled using said plurality of variable angle pushing rods such that a first individual variable angle pushing rod and a second individual variable angle pushing rod of said plurality of variable angle pushing rods have an ability to have different angles relative to said axis of said sonde or borehole.

Accordingly, Applicant respectfully requests consideration of these claims and further request that the above-noted claims be indicated as being allowable.

CONCLUSION

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious Applicant's invention, as recited in each of claims 1-46 and new claims 48-57. The

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applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Further, any amendments to the claims which have been made in this response and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all the claims therein are respectfully requested and now believed to be appropriate.

Should the Examiner have any questions or comments, he is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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May 29, 2008
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